



**Federal Utility
Partnership Working Group**
Combined Heat and Power

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Generation

Agenda



- Southern Company
- Combined Heat and Power (CHP)
- Southern Company CHP
- Utility Partnerships

Southern Company Overview

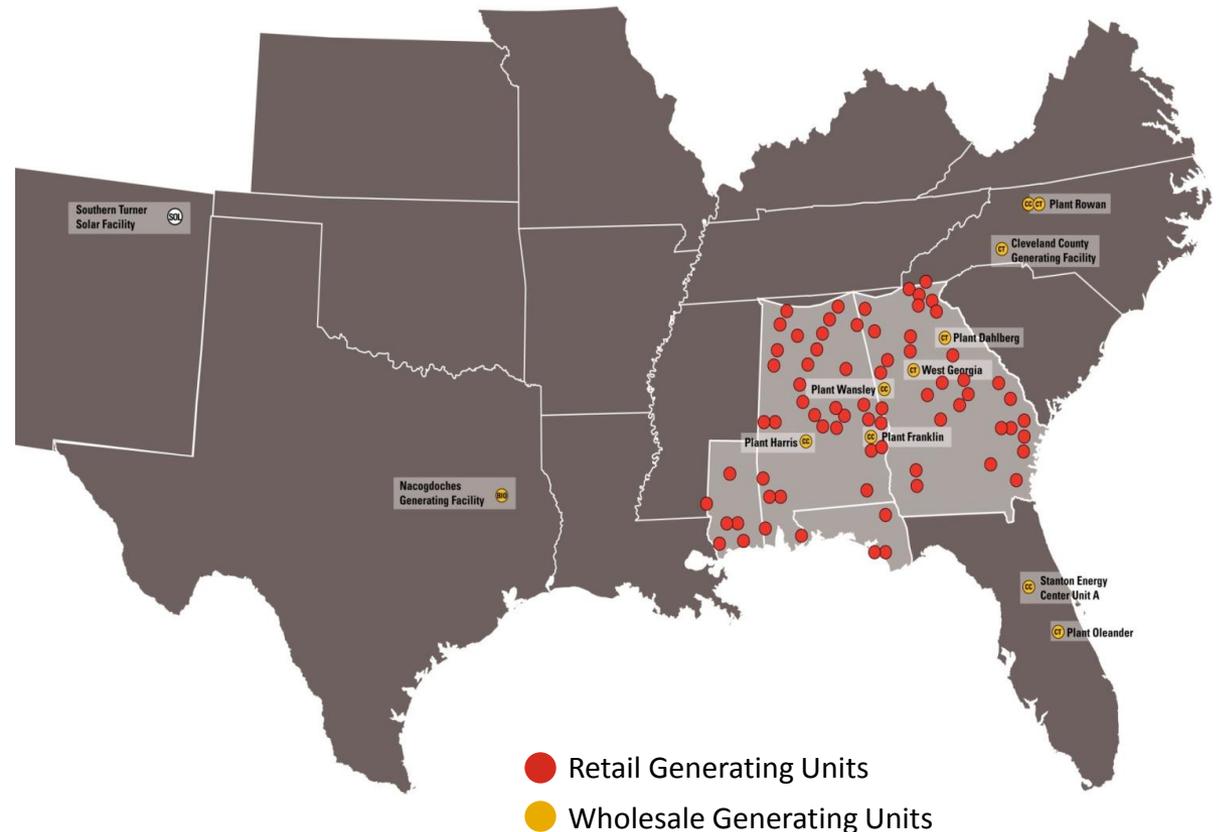


Operating Companies:

- Alabama Power
- Georgia Power
- Gulf Power
- Mississippi Power

Subsidiaries:

- Southern LINC
- Southern Nuclear
- Southern Power
- Southern Telecom



Southern Company Overview



- 4.4 million customers
- 43,500+ MW
- 26,000+ employees
- 120,000 square miles of retail service territory
- 27,000 mi. of transmission lines
- 3,700 substations
- \$17.7B in operating revenue
- \$2.2B in net income
- \$39.2B in market cap
- \$59.3B in assets
- \$13.5B annual op. expense

Combined Heat and Power (CHP)



- CHP is the simultaneous creation of both electricity and heat from a single fuel source



CHP Uses



- Two outputs: (1) Electricity and (2) Thermal energy
- Thermal energy used for
 - Space heating (steam or hot water loop)
 - Space cooling (absorption chiller)
 - Process heating and/or cooling
 - Dehumidification (desiccant regeneration)
- Heavily used in
 - Pulp & Paper
 - Chemical
 - Automotive

CHP Configurations



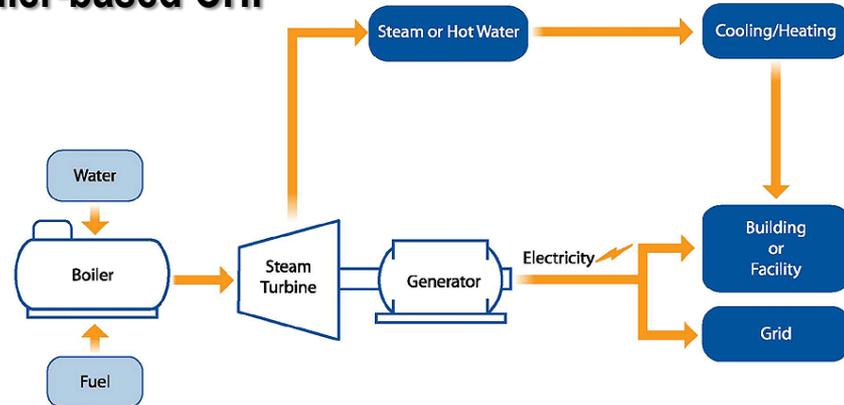
Technology alternatives

- Reciprocating engines
- Combustion turbines
- Steam Turbines

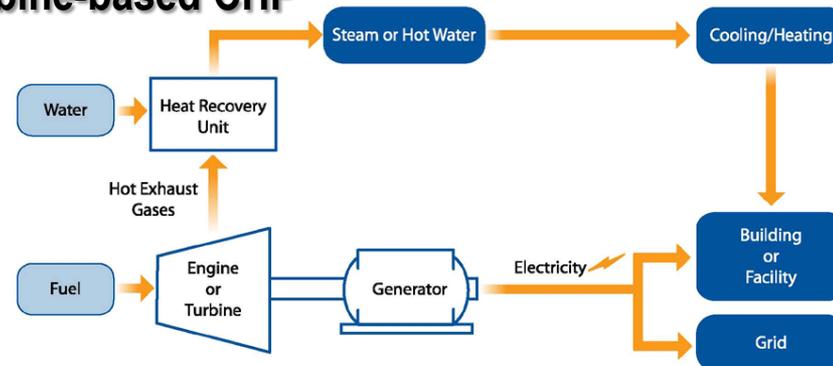
Fuel alternatives

- Natural gas
- Fuel oil
- Diesel
- Coal
- Renewable (Biomass, Landfill Gas, etc.)

Boiler-based CHP



Turbine-based CHP



U.S. Environmental Protection Agency
<http://www.epa.gov/chp/basic>

CHP Objectives & Drivers



- Operating cost reductions
- Facility efficiency increases
- Energy security enhancements
- Emission reductions
- Renewable energy
- Various Federal energy goals
 - Legislative Statutes, Executive Orders, and Branch specific directives

CHP Considerations



- Every project is unique – one size does not fit all
 - Require detailed evaluations
- Projects must benefit all parties and appropriately balance risk
 - Capital
 - Fuel
 - Operations
- Environmental rules and regulations
 - Mercury and Air Toxic Standards (MATS)
 - Industrial Boiler Maximum Achievable Control Technology (IBMACT)
 - National Ambient Air Quality Standards (NAAQS) – Attainment/Nonattainment

Examples of CHP Evaluation Inputs



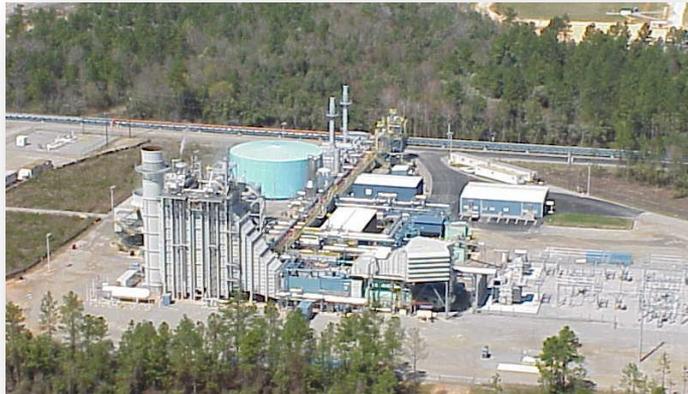
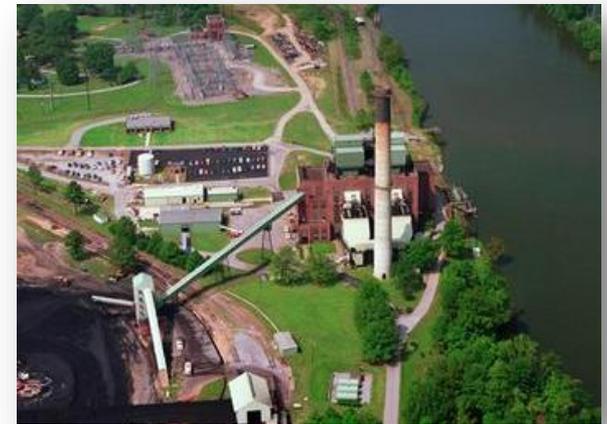
- Power requirements
- Thermal requirements
- Customer load profile
 - Electricity and thermal
- Fuel
 - Type
 - Availability
 - Flexibility (multi-fuel)
 - Price
- Back-up generation requirements
 - Need and cost
- Costs
 - Equipment
 - Installation
 - Financing
 - Interconnection
 - Permitting
 - Operating
- Utility rates
- Incentives/mandates
 - Federal and State
- Site characteristics

Southern Company Owned CHP



- Chevron Pascagoula, MPC – 143 MW (CT)
- Gadsden Alabama, APC – 120 MW (Coal)
- Pea Ridge, GULF – 12 MW (CT)
- Washington County, APC – 123 MW (CC)
- GE Plastics, APC – 105 MW (CC)
- Theodore Alabama, APC – 236 MW (CC)

Over 45 Years

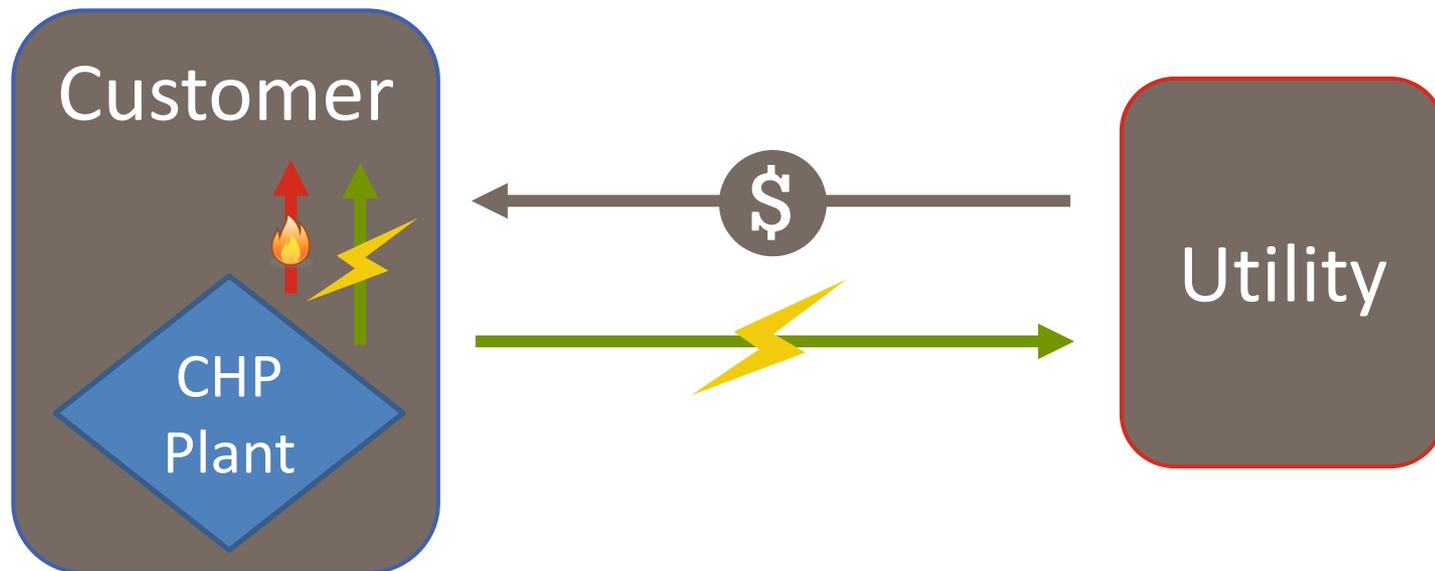


Over 700 MW

Southern Company Customer Owned CHP



- Procure electrical output from customer owned CHP



- Over 15 CHP Facility evaluations in past 5 years
 - Industrial (Pulp & Paper, Chemical, Automotive, etc.)
 - Department of Defense (Air Force, Army, Navy, Marine Corps)
 - Federal and State agencies (NASA, Municipalities, Universities, etc.)

CHP Utility Partnerships



- CHP Facility evaluated as part of resource expansion plans
- Ownership and operational complexities borne by Utility
- Core competency for Utility
- Seeking win-win scenarios
 - Customer has reduced energy costs
 - Utility has increased efficiency
 - No harm to other customers
- Energy security
 - Generation assets located on customer facility

Southern Company Collaboration



- Southern Company Federal Energy Initiative (SFEI)
- Ensure consistent coordination and strengthen partnerships across system with federal agencies
- Partner to help accomplish comprehensive energy goals and mandates for:
 - Energy Security (Military defined security vs. reliably served)
 - Renewable Energy (Biomass, bio-fuels, solar, wind, landfill gas)
 - Energy Efficiency (Energy Intensity & Fossil-fuel Reductions)
 - Greenhouse Gas Reductions
- Multi-phased energy project evaluations
- Mutually beneficial projects

SFEI Energy Project Evaluation



- Evaluate potential energy project partnerships
 - Renewable (Biomass, Solar, etc.)
 - Traditional resources (Natural Gas, Diesel, Fuel-oil)
- Determine CHP opportunities
 - Thermal needs
 - Current costs
- Project requirements
 - Cannot adversely impact other customers
 - Regulatory approval

Wrap-up



- Combined Heat and Power (CHP)
 - Provides potential for energy efficiencies and cost reductions
 - Every application is unique
- Southern Company CHP
 - Long history of CHP (Owned and PPA)
 - Continue to evaluate opportunities
- Utility Partnerships
 - SFEI
 - Potentials for win-win scenarios

Questions?



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POWER
A SOUTHERN COMPANY

GEORGIA
POWER
A SOUTHERN COMPANY

SOUTHERN
COMPANY

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OPERATIONS

Unite. Innovate. Execute. **Generation**